# Towards Dialogue Strategies for Cognitive Workload Management

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## Abstract

Although it has been shown that drivers are less distracted when using speech interfaces compared to traditional interfaces, using voice control instead of manual controls does not completely solve the problem with distracted drivers. The interaction with the dialogue system may itself add to the driver's cognitive workload and may therefore be a safety issue. The main purpose of this thesis is to learn more about in-vehicle dialogue during various types of cognitive workload, to use this knowledge to enable safe and non-distracting dialogue system interaction in vehicles. We do this by analysing a corpus of human-human in-vehicle dialogue to learn more about the dialogue strategies used by drivers and passengers during various types of workload. We discuss the types of cognitive workload that we believe are most important to consider when studying the multitasking activity of driving and interacting with a dialogue system, and suggest a method for distinguishing different types of workload by using information about the driver's workload and driving behaviour. We found that dialogue strategies such as interruptions – in the form of silent pauses and domain switches – are used in response to the driver's cognitive workload, as well as resumption of unfinished discussions. These behaviours are analysed in order to find strategies for preventing, or shortening the duration time of, high cognitive workload. We also indicate how these strategies can be implemented in in-vehicle dialogue systems.

**Keywords:** cognitive workload, workload types, dialogue system, vehicles, dialogue strategies, interruption in dialogue, resumption in dialogue